

Abstract: Effectiveness of Loan Guarantees vs Tax Incentives for Space Launch Ventures

Over the course of the past few years, several new and innovative fully or partially reusable launch vehicle designs have been initiated with the objective of significantly reducing the cost of space transportation. These new designs are in various stages of hardware development for technology and system demonstrators. The larger vehicles include the Lockheed Martin X-33 technology demonstrator for VentureStar and the Space Access launcher. The smaller launcher ventures include Kelly Space and Technology and Rotary Rocket Company.

A common denominator between the new large and small commercial launch systems is the ability to obtain project financing and at an affordable cost. Both are having or will have great difficulty in obtaining financing in the capital markets because of the dollar amounts and the risks involved. The large established companies are pursuing multi-billion dollar developments which are a major challenge to finance because of the size and risk of the projects. The smaller start-up companies require less capital for their smaller systems, however, their lack of corporate financial muscle and launch vehicle track record results in a major challenge to obtain financing also because of high risk.

On Wall Street, new launch system financing is a question of market, technical, organizational, legal/regulatory and *financial* risk. The current limit of acceptable financial risk for Space businesses on Wall Street are the telecommunications and direct broadcast satellite projects, of which many in number are projected for the future. The recent problems with Iridium market and financial performance are casting a long shadow over new satellite project financing, making it increasingly difficult for the new satellite projects to obtain needed financing.

Wall Street risk perceptions for new reusable launch vehicles *far exceed* the risk aversion limit for commercial satellites. Therefore, new launch vehicles, and in particular the small start-ups, have a nearly impossible task to crack the capital markets for needed development funds. As a prime example, Kelly, Rotary, and Pioneer reported that they had raised only 5% of their combined required capital as of May 1999.

There has been much dialog and rhetoric recently in the Aerospace community regarding what the US government role should be with respect to helping the new commercial launchers financially to become successful. Senate Bill S.469 has been introduced into the Senate to provide loan guarantees for the development of new, low cost launch systems. Some of the companies developing new launchers support the bill; others claim that tax incentives are a better approach, and some say that the government should keep hands off entirely.

The subject presentation explores the financial effectiveness of two candidate US government financial incentives: loan guarantees and tax incentives. The results of the examination are presented in terms of (1) reduction of financial risk from a Wall Street perspective, (2) effects on investor return requirements ("hurdle rates"), and (3) effects on

project rate of return, and investor before-tax and after-tax rates of return. Expected costs to the government of loan guarantees and tax incentives are compared. The results contained in the presentation represent extensive work over the past several years with both sell-side Investment Bankers and buy-side Institutional Investors by the author.



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DRAFT

Effectiveness of Loan Guarantees vs Tax Incentives for Space Launch Ventures

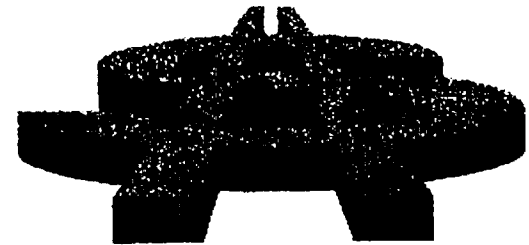
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Much Debate Over Which is the Best Approach for Government Incentives

- **Do Nothing**
- **Government Commercial Loan Guarantees**
 - New Launch Systems Will Cost Up to \$Billions to Develop
 - Debt Will be a Major Component of New Launch System Financing - As High as 80% of the Capital Required
 - Loan Guarantees for Up To 80% of Debt
- **Tax Incentives**
 - Liberalized 20% R & E Tax Credit
 - Net Benefit Today < 3%
 - Roll Back to 12 % Net Benefit
 - Unrestricted 20% R & D Tax Credit
 - 10-year Tax Holiday





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Commercial Non-Recourse Debt Financing

THE WORD FROM WALL STREET

- **CANNOT OBTAIN LAUNCHER DEBT FINANCING WITHOUT GOVERNMENT LOAN GUARANTEES**
 - Too Risky
 - Too Big
 - Many Other Competing Investment Opportunities
- **CANNOT AFFORD DEBT WITHOUT GOVERNMENT LOAN GUARANTEES**
 - Interest Rates Without Guarantees ~ 14% - 17% or Higher because of High Risk Perception, *IF* Could Obtain Financing
 - Interest Rates WITH Guarantees ~ 7%

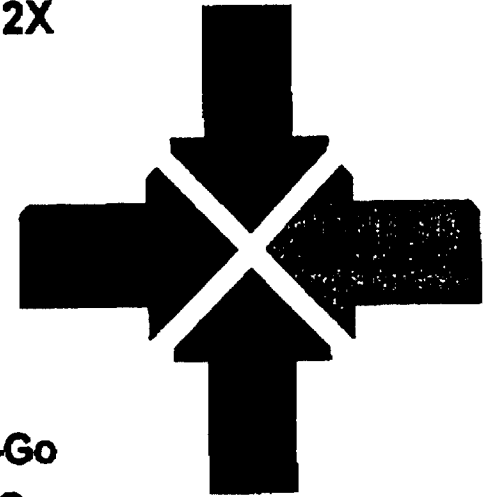


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The Loan Guarantee Is the Most Powerful and the *Only Multi-dimensional* Incentive

LOAN GUARANTEES REDUCE FINANCIAL RISK

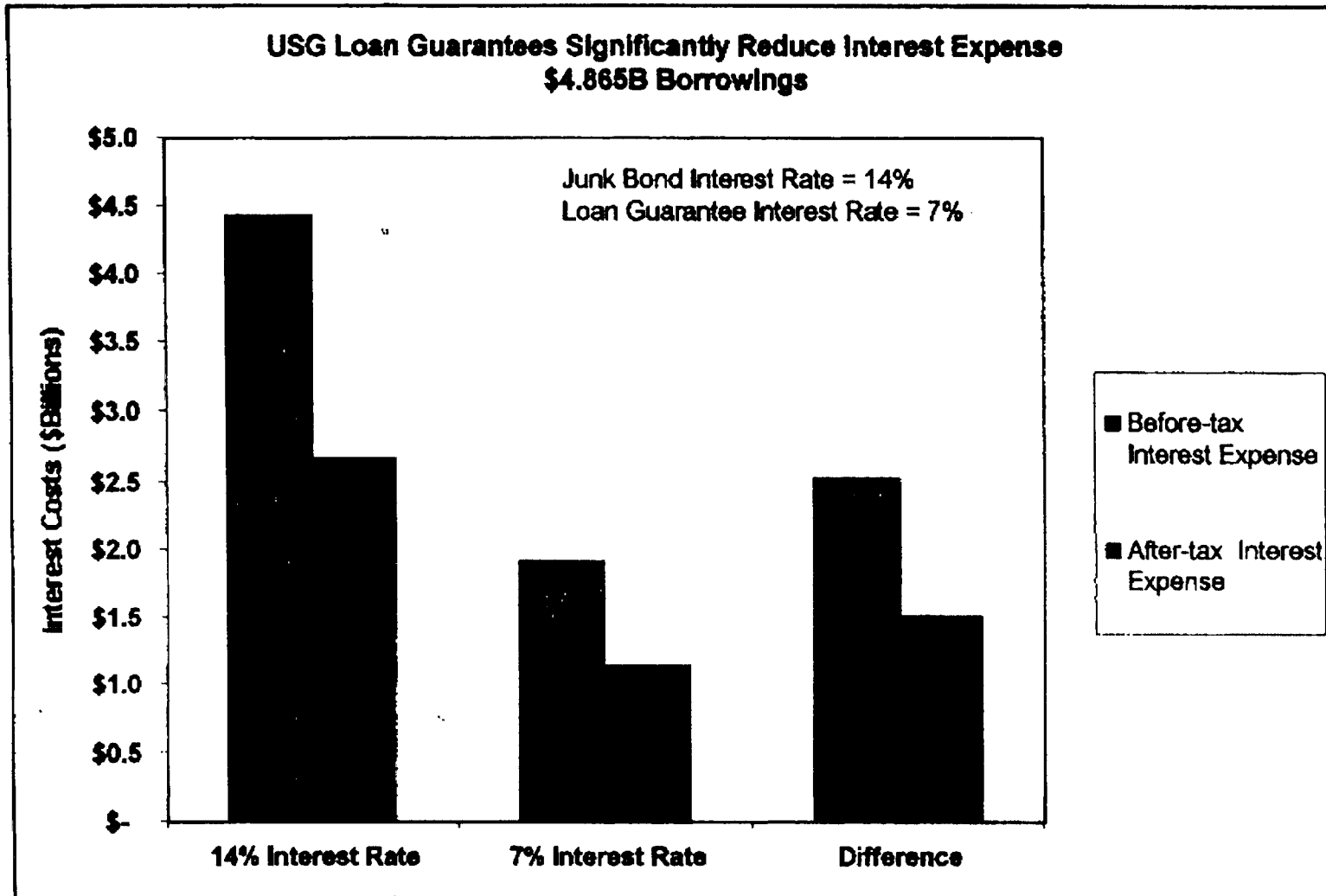
- **Enables *Availability* of Non-Recourse Debt Financing**
 - LMT or Boeing Can Obtain Debt Without Loan Guarantees
 - All Others: *Cannot Be Obtained Without It*
- **Reduces the Cost of Debt Financing by Greater than 2X**
 - Without Loan Guarantees: Interest Rate \approx 14% or More
 - With Loan Guarantees: Interest Rate \approx 7%
- **Enables A Much Higher Debt/Equity Ratio**
 - Without Loan Guarantees \approx 50/50 max
 - With Loan Guarantees = up to 80/20
- **Enables A Much Longer Loan Term**
 - Without Loan Guarantees = 5 - 7 years / Repay As-You-Go
 - With Loan Guarantees = 10 - 15 years / Defer Repay to Ops
- **Reduces Wall Street Investor Returns Hurdle Rates by \approx 25% due to Lower Financial Risk: *As Important as Any Benefit***





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Loan Guarantees Dramatically Decrease the Cost of Debt



Over \$2,500,000,000 Before-tax Savings With US Loan Guarantees



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Tax Incentives Not Nearly As Effective for Industry As Loan Guarantees

- **Tax Incentives: Only One-Dimensional**
 - Provide Cash Flow Benefit
 - *Do Not Reduce Risk Perception on Wall Street*
- **Need *Income* to Benefit From Tax Incentives**
 - Structured Correctly Can Pass-back Tax Benefits to Partners: *Do They Have US Income To Offset?*
- **Tax Credits: Can be of Benefit During Development Phase If Can Sell Them Off**
 - Current R&E Tax Credit Severely Watered-Down
 - May Only Get 70¢ On the Dollar
- **Tax Holiday: Need to Be Able to *Finance*, Build and Operate a Successful RLV *Before* Get to the Tax Benefit Downstream**
 - Not Effective To Obtain *Development Financing* No Matter How Good. It Might Make Total Returns Look



New Tax Legislation Extremely Difficult to Get Through Congress



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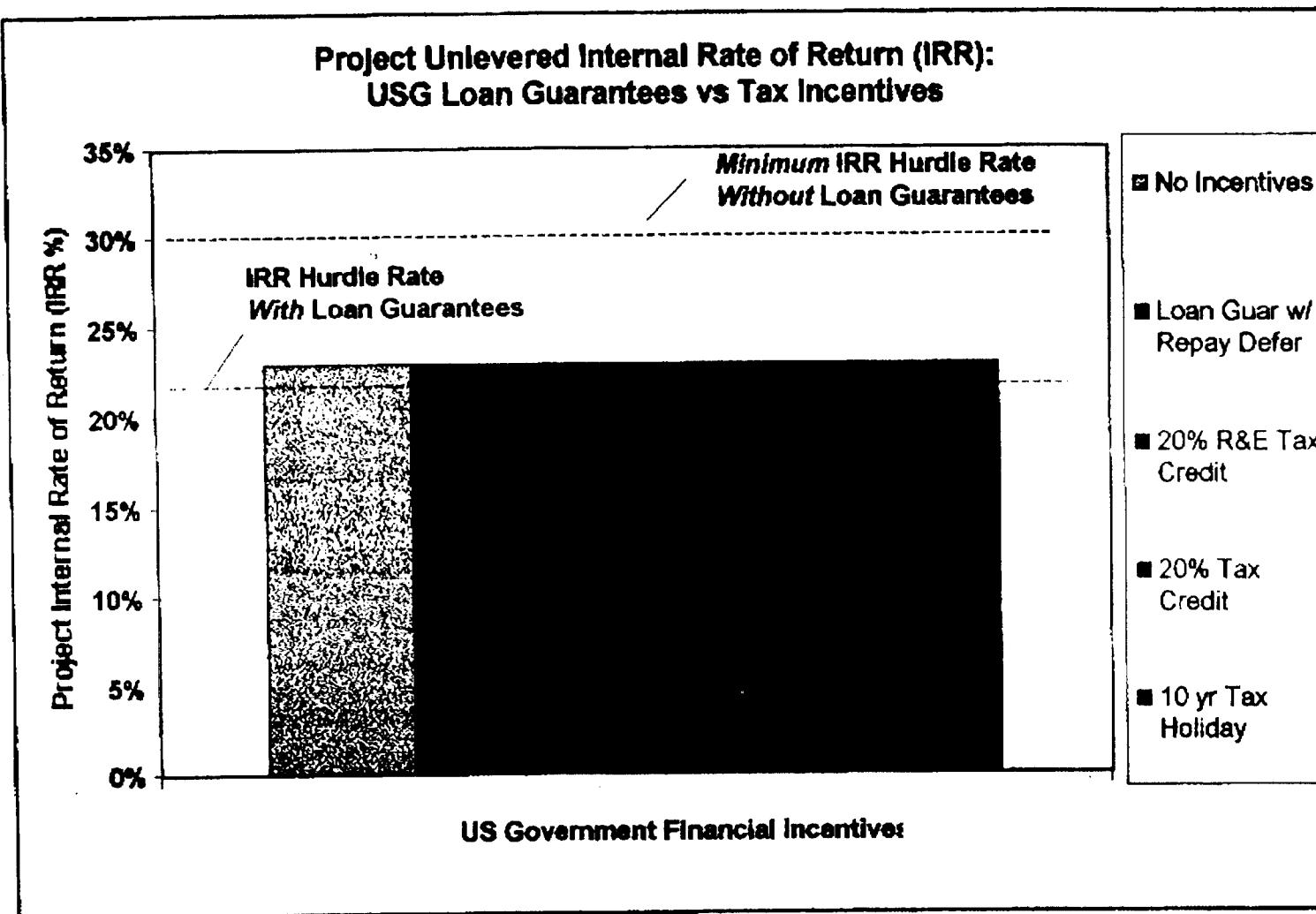
Financial Effectiveness Assessment Approach

- **Hypothesize a Medium-Heavy RLV Venture**
 - Development & Fielding Cost = \$6.5B Over 5 Years
 - Yearly Revenue Stream
 - 14 ISSA Flights @ \$100M/flt
 - 16 GTO Flights @ \$55M/flt
 - 2 LEO Flights @ 45M/flt
- **Financing**
 - D/E = 80/20
 - Loan Guarantees for 80% of Debt with Repay Deferral
- **Financial Measures of Merit**
 - Unlevered Project Rate of Return
 - Financing Schemes or Tax Consequences Not Included
 - Considers Project Cash Flows Only
 - Investor Before-tax Rate of Return (B/T ROE)
 - Investor After-tax Rate of Return (A/T MIRR)
 - Investor After-tax Net Present Value (A/T NPV)
- **Compare with Guarantees and Tax Incentives**



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US Government Loan Guarantees Reduce Unlevered Project IRR Hurdle Rate

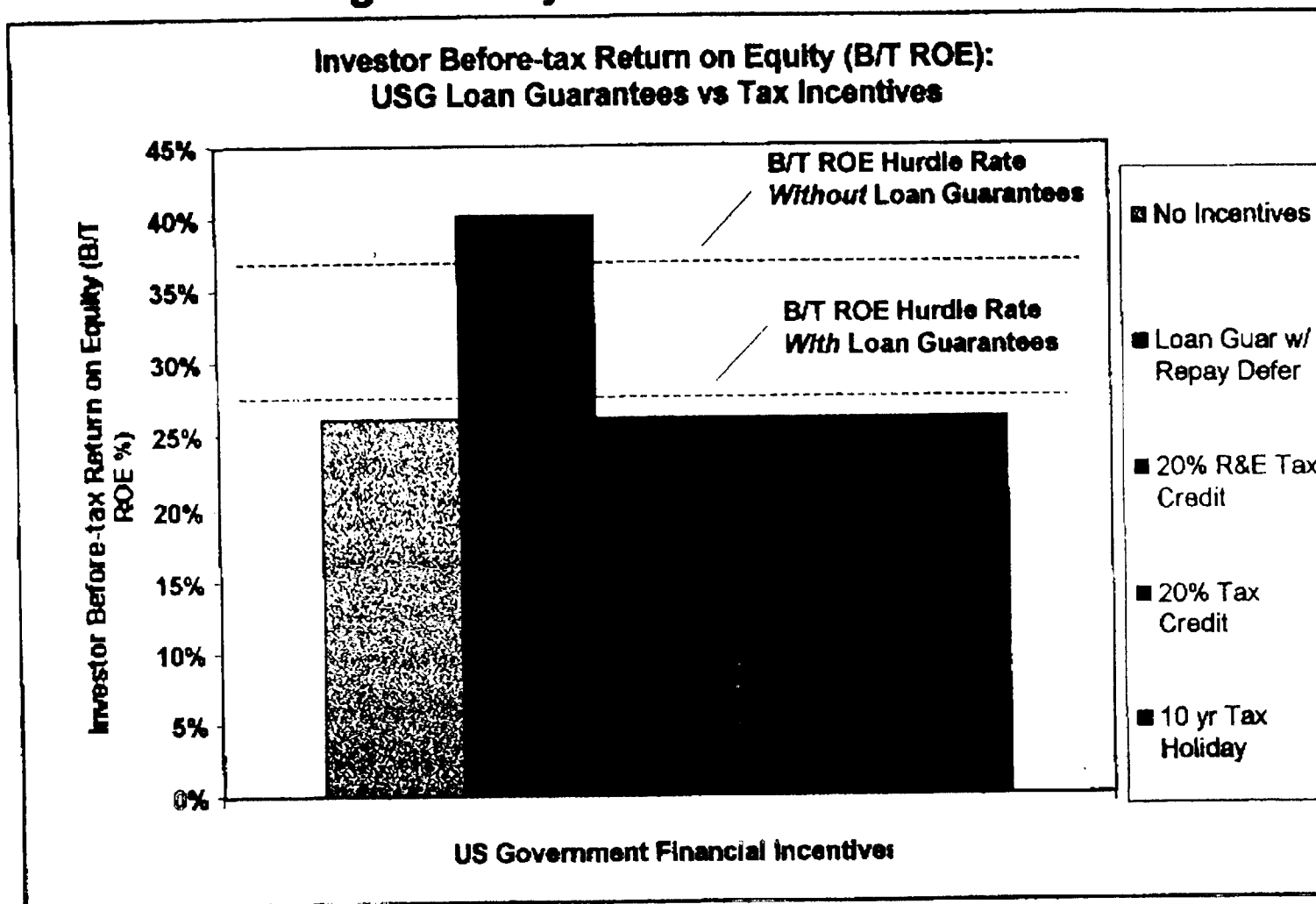


Loan Guarantee Is The Only Incentive That Exceeds Its Hurdle Rate



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US Government Loan Guarantees Result In Significantly Better Investor Before-Tax ROE

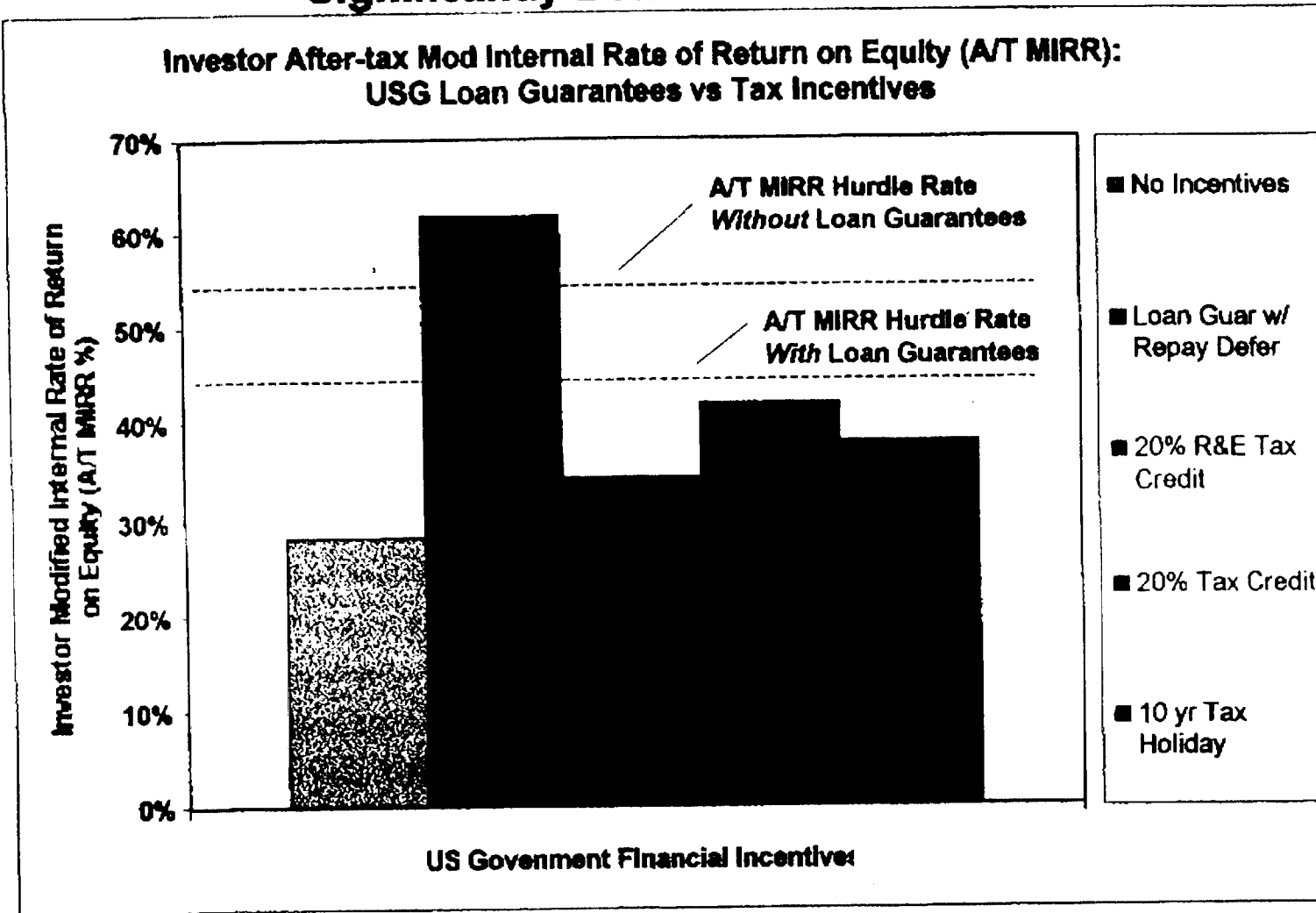


Loan Guarantees Are The Only Incentive That Exceeds Its Hurdle Rate



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US Government Loan Guarantees Result In Significantly Better Investor After-Tax MIRR

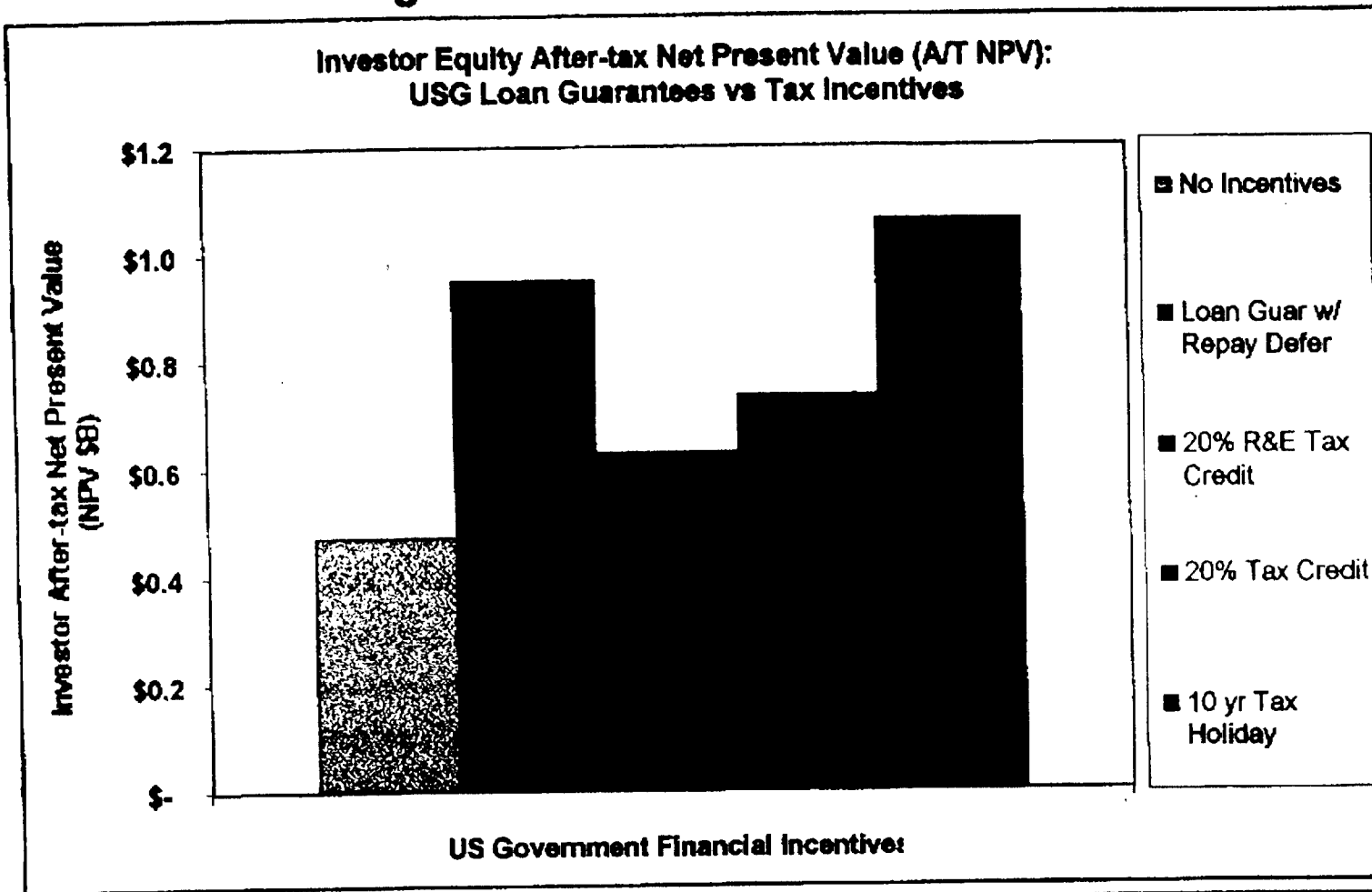


Loan Guarantees are The Only Incentive That Exceeds Its Hurdle Rate



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10-Year Tax Holiday Results in Marginally Higher Investor After-Tax NPV@20%, *BUT*.....

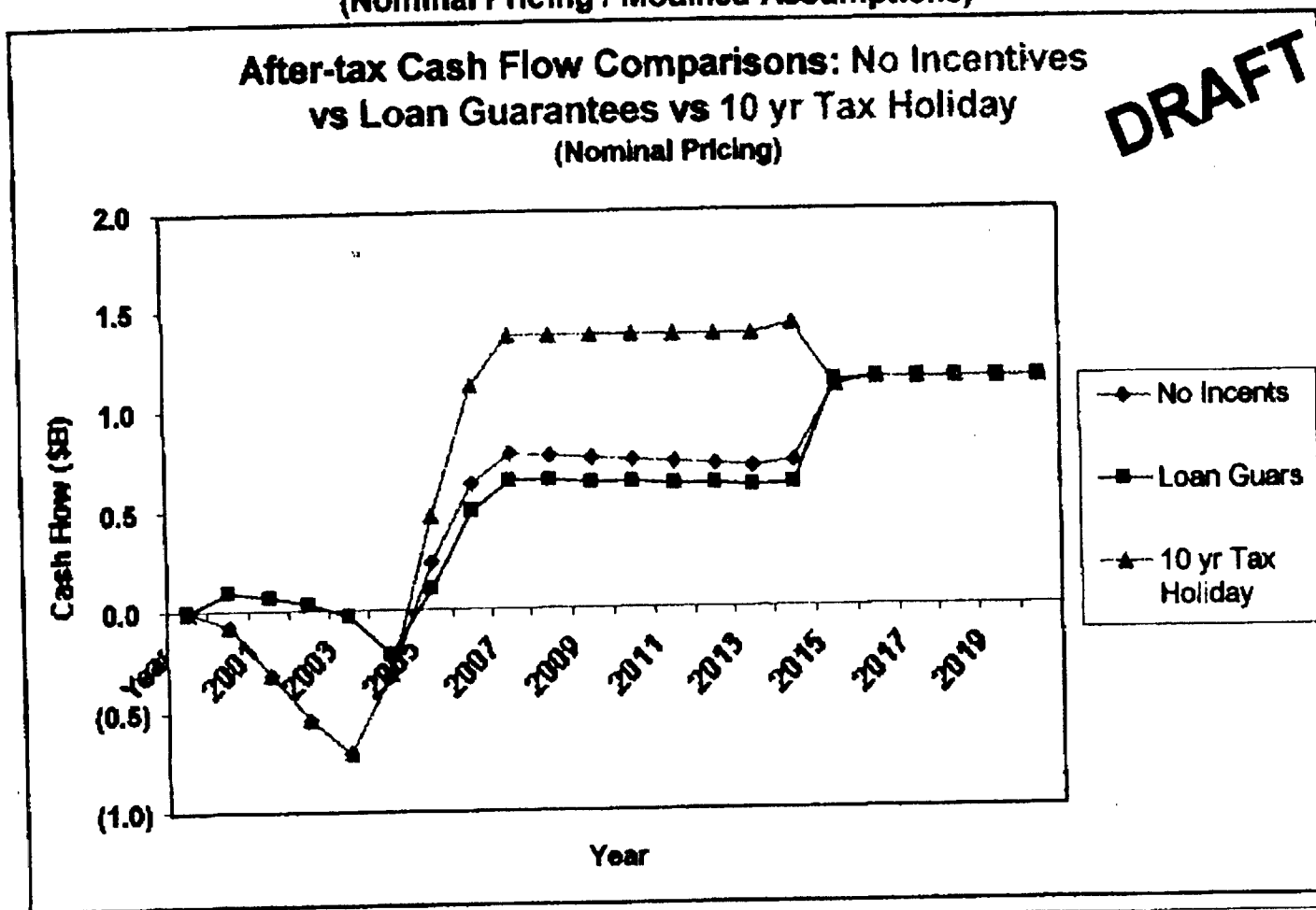


- **HAVE TO DEVELOP THE SYSTEM AND GET TO OPERATIONS FIRST!!!**
- **TAX HOLIDAY IS OF LITTLE USE IN FINANCING RLV DEVELOPMENT**
 - **Wall Street Will Discount It Heavily**



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Comparison of After-tax Cash Flows for No Incentives vs Loan Guarantees vs 10 yr Tax Holiday (Nominal Pricing / Modified Assumptions)



- Loan Guarantees Dramatically Reduce A/T Cash Outflows During Development
 - High Leverage and Tax Write-offs Actually Provide Initially *Positive* A/T Cash Flows
- Tax Holiday Dramatically Increases A/T Cash Inflows During First 10 years of Ops



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Which Financial Incentive Is a Better Deal for the US Government?

US GOVERNMENT LOAN GUARANTEES

- Cost US Government *Nothing* if No Default
 - Actually Can Make Money on Fees (OPIC)
- Default Cost Probability *Decreases* With Time
- Can Be Easily Targeted to an Industry
 - Many Precedents: FHA, OPIC, MARAD..... (\$280B Worth)

US TAX INCENTIVES: Tax Credits & Holidays

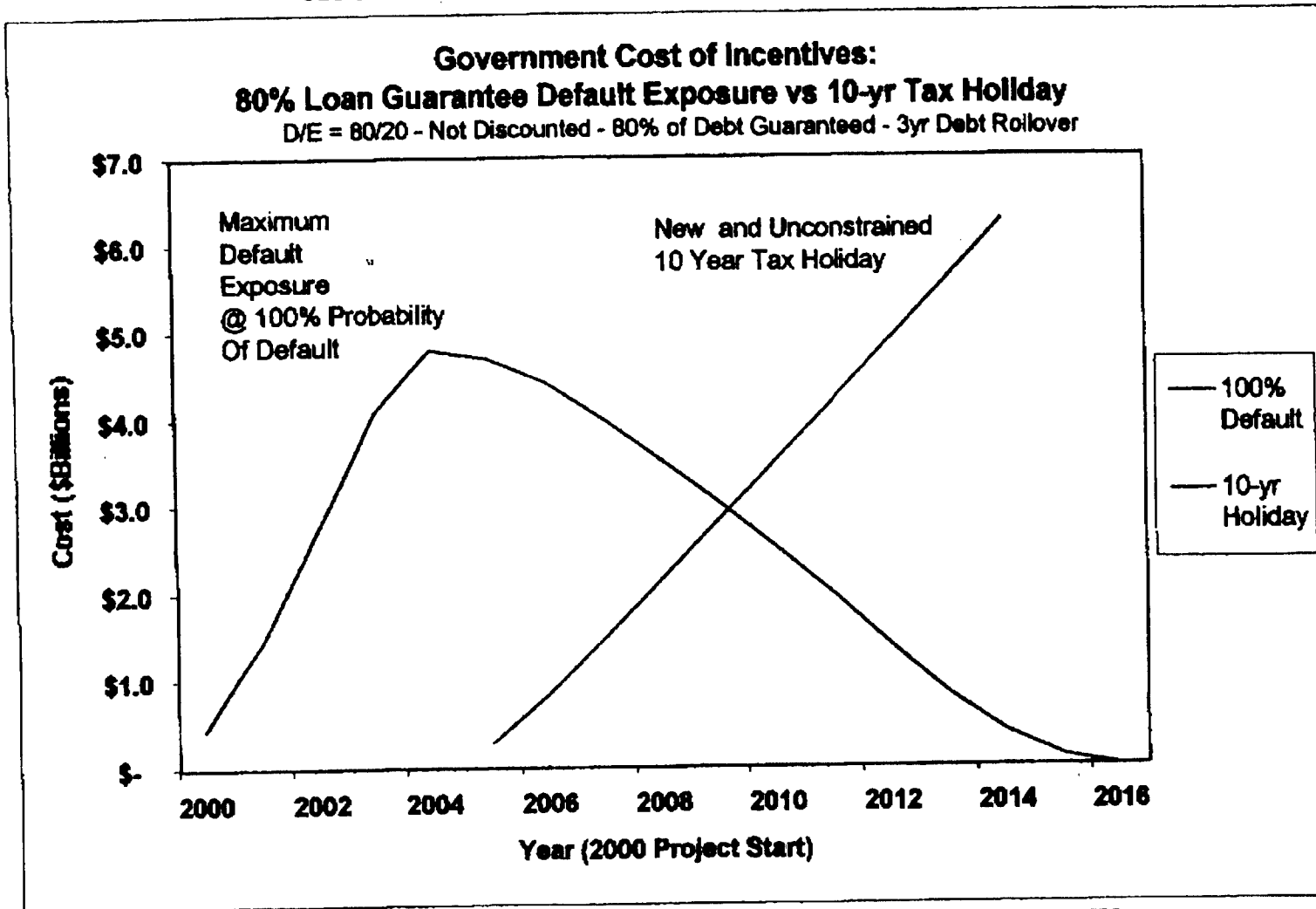
- Cost More Than Loan Guarantees
 - Even for 30% Loan Default Probability
- Tax Incentive Cost Probability = *100% !!!*
- Unconstrained Cost
 - No Limit on Government Costs: Open to Many
 - Targeting Viewed as “Corporate Welfare”
- Tax Incentives Cost *Increases* With Time
- Major New Tax Bill Not Offered Every Year, Is Nearly Impossible to Pass, and Can’t Be Relied Upon
 - Any Tax Incentive Is Subject to Political Winds and Could Be Cancelled or Allowed to Expire at Any Time





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10 Year Tax Holiday Costs the US Government More Than Worst Case Default Scenario

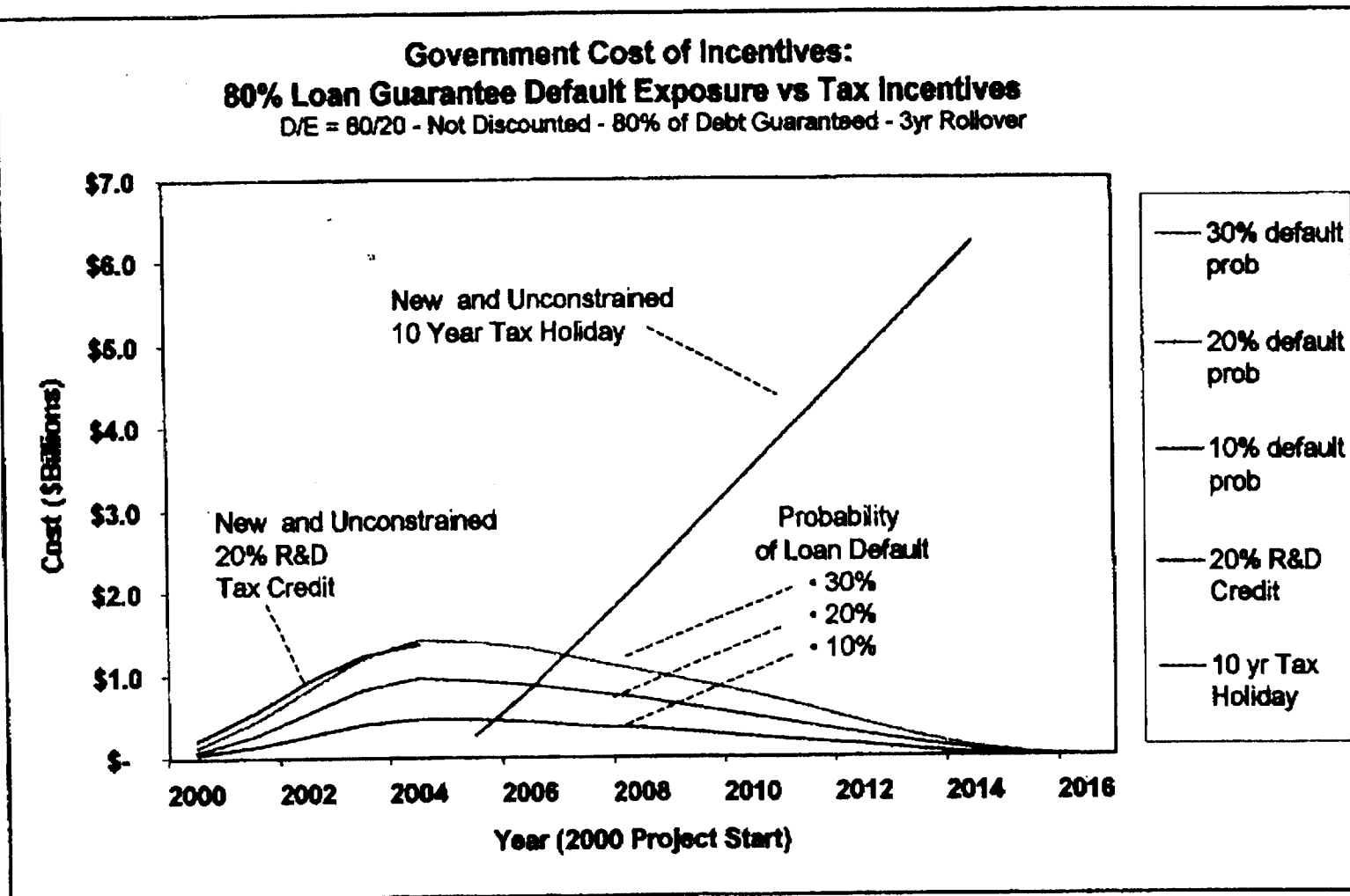


- Loan Default is Probabilistic
- Tax Holiday is Deterministic = 100% Likely



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Loan Guarantees Are a Better Deal For the US Government Than Tax Incentives

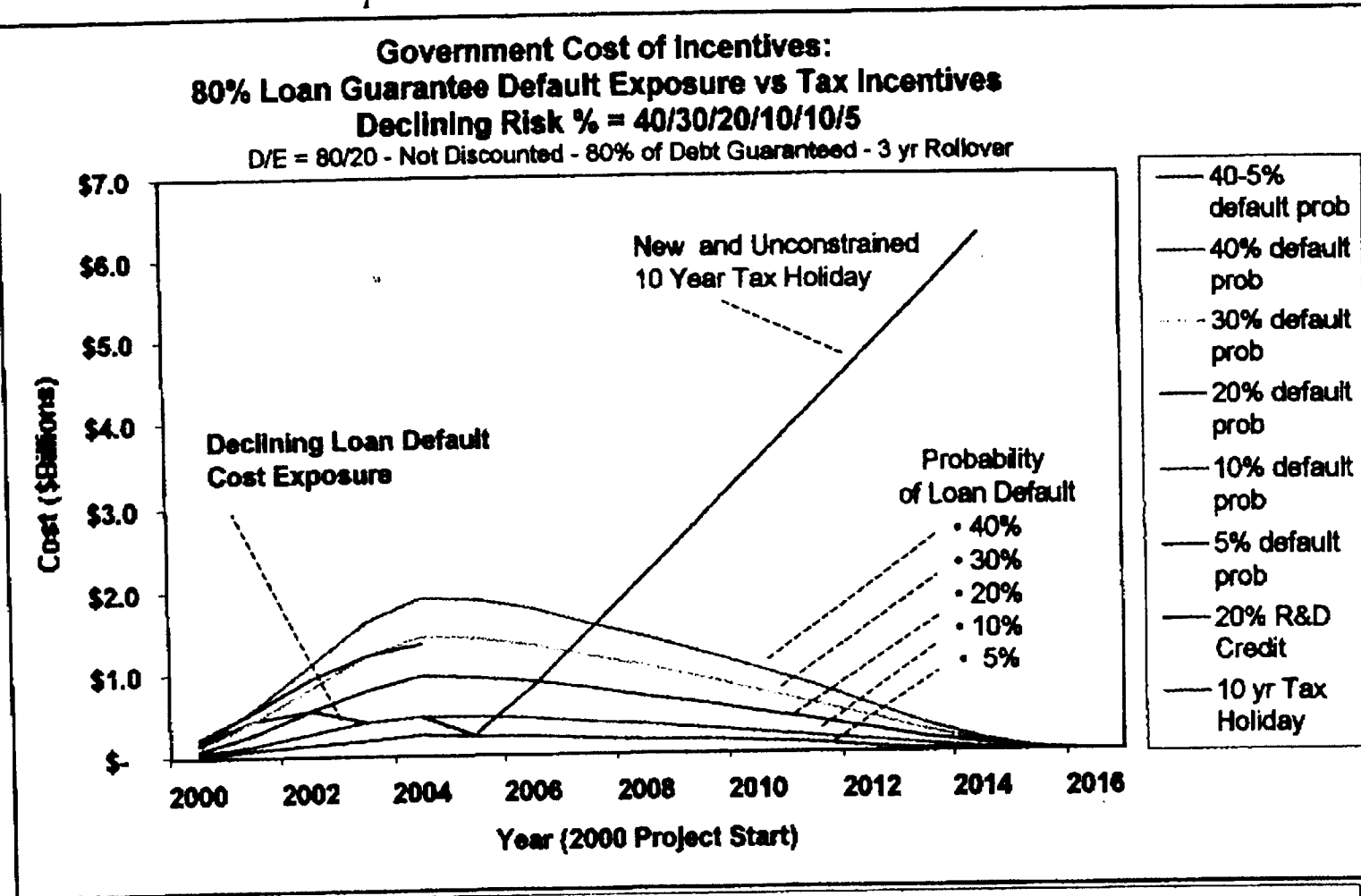


- 20% R&D Tax Credit Cost > Up to 30% Probability of Loan Default
- 10 Year Tax Holiday Cost >>> Loan Default Probabilistic Cost



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Venture Risk Declines as Project Matures



- Risk Should Be on the Decline By the Time Peak Debt Is Reached Thereby Reducing the Maximum Probable Exposure
- Declining Risk Reduces Probabilistic Default Cost to Well Below 20% R&D Tax Credit and 10-year Tax Holiday



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Conclusions: Loan Guarantees are a Winner

LOAN GUARANTEES ARE A BETTER DEAL FOR INDUSTRY

- **Loan Guarantee Is The Only Incentive That Satisfies *All* Wall Street Requirements BECAUSE IT REDUCES FINANCIAL RISK = *Multi-Dimensional* Incentive**
- **Loan Guarantee Program Will Help the Small Launcher Ventures *RIGHT NOW***
 - **Availability of Capital Which Otherwise NOT Available**
 - **Much Lower Cost of Capital**

LOAN GUARANTEES ARE A BETTER DEAL FOR THE US GOVERNMENT

- **Loan Guarantees *Cost the Government Nothing* Unless Default**
 - **"Cost" Less Than Tax Incentives Even at 30% Probability of Default**
- **Tax Incentives Have *100% Cost Incurrence* Probability to the US Government**
- **Loan Guarantee Legislation Much, Much Less Difficult than a Special-Interest Tax Bill Which is Near Impossible to Pass**